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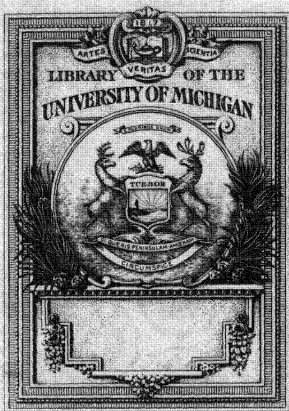
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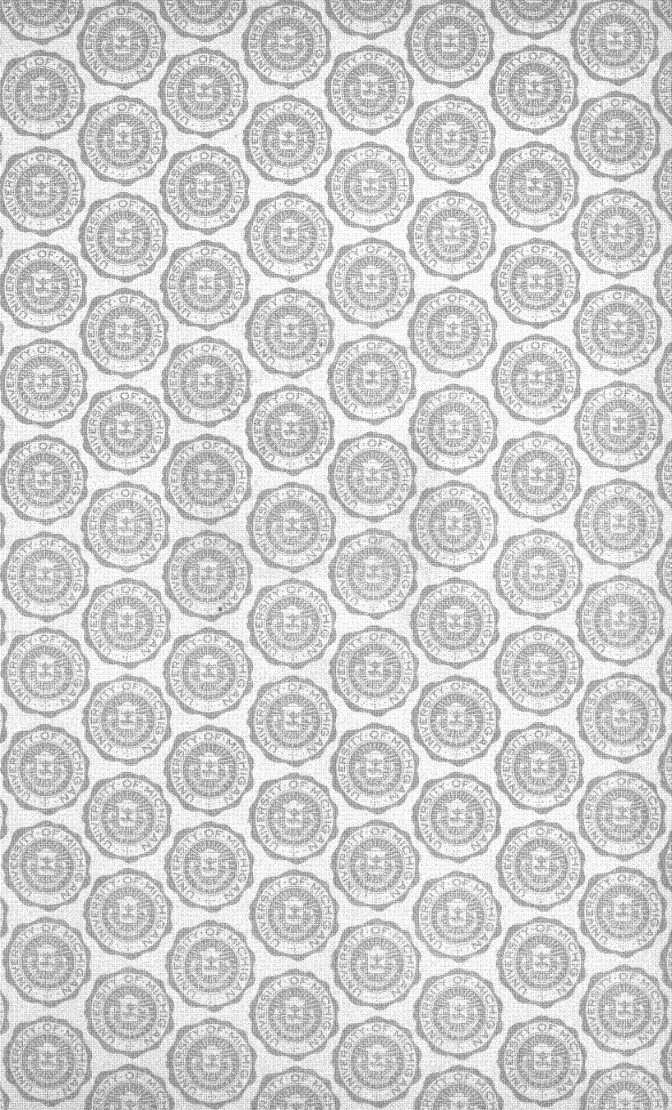
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OCCASIONAL PAPERS

OF THE

BERNICE PAU^uHI BISHOP MUSEUM, ^{*Honolulu*} (OF
POLYNESIAN ETHNOLOGY AND
NATURAL HISTORY.)

VOLUME IV.

HONOLULU, H. I.
BISHOP MUSEUM PRESS.
1906-1911

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OCCASIONAL PAPERS

OF THE

BERNICE PAUAI BISHOP MUSEUM OF POLYNESIAN ETHNOLOGY AND NATURAL HISTORY.

VOL. IV.—No. 4.

Director's Report for 1909.

HONOLULU, H. I.
BISHOP MUSEUM PRESS.
1910

To the Trustees of the Bernice Pauahi Bishop Museum.

Sirs:—In accordance with the standing vote of the Trustees, I submit my annual report on the present condition of this Museum and the general course of work done in the year 1909.

WILLIAM T. BRIGHAM,

Director of the Museum.

Honolulu, April 13, 1910.

Ordered printed August 2, 1910.

REPORT

THE year 1909 has been one of progress in this Museum, but still more one of preparation. After some years of great inconvenience and repression from want of workrooms and of safe storerooms, towards the end of the year arrangements were made to build a Laboratory commensurate with the needs of such a museum as this has become in the twenty years of its existence, and probably before the end of another year this long desired building will be ready for use.

For more than a year the Museum staff has been insufficient for the work to be done, and our laboratory space precluded the employment of additional specialists, but the spirit of loyalty to the best interests of the Museum has animated our little company to efforts that seemed almost impossible in our limited and inconvenient quarters. We have been scattered; one department working in Manoa Valley, another in Nuuanu Valley, while a third has operated in the midst of the fish market region. Such segregation has somewhat lessened the resulting accomplishments, and the prospect of a new portion of the building where all departments have their own quarters within reach of the collections and the working library is a most agreeable one.

It has not seemed well to recommend the appointment of a marine zoologist for the staff because we had no suitable place for the preparation and study of specimens of the wonderful marine life to be found on our reefs at all seasons of the year. Not a day of the three hundred and sixty-five when fear of malaria haunts the shore or a low temperature checks the life current of the coral polyp or any other of the (often undescribed) inhabitants of the clear waters that surround these islands. In no marine zoological

station already established are there such ideal conditions for study, and should it be announced that we desired a marine zoologist many would be the applicants for such a chance for original investigation. To those who rate highly the discovery of new species our reefs offer a rich field, for in the collections made in three days by the members of the present staff on this island and on Molokai, none of them specialists in marine zoology, Dr. Vaughn, of the United States National Museum, found a dozen new species, some of great interest. Surely this mine is not yet worked out; it is easily accessible and vastly attractive. But to those who desire to know more of the structure and life history of the reef-dwellers a more convenient place for study can hardly be desired than here found on our reefs.

In the deed which established the Bernice P. Bishop Museum as an independent institution, definite reference was made by the founder to the possible establishment, under the auspices of this museum, of a Marine Aquarium for the study of life on our reefs and the public exhibition of their most interesting inhabitants in a living condition. While the funds are not at hand for such an establishment as should be on this island, much can be done with the conveniences of the new laboratory to collect and study the smaller "Harvest of the Sea," and it is hoped that another year may see the department of Marine Zoology inaugurated.

It would be pleasant to anticipate some of the many advantages to accrue from the possession of suitable work- and store-rooms, but it is perhaps wiser to wait until we move into and try our new domain, and are able to install the apparatus brought from Berlin fourteen years ago. After such an interval we can surely wait another twelvemonth.

From the things that may be in the future we turn to some of those in hand, and it is pleasant to call attention to the gift by the Hon. Wm. R. Castle of perhaps the most valuable single collection we have received by gift. I had been in correspondence with one of the Australian pioneers, Mr. J. F. Connelly, a surveyor who

had explored extensively in western Australia for many years. He had collected from the natives among whom his profession led him, a fine series of implements of peace and weapons of war, which he wished to dispose of. We had no funds and it seemed impossible to save these treasures, when Mr. Castle came to our aid and purchased for us the collection which is now in our cases and has more than doubled our former collection of Australian specimens. The list given by Mr. Stokes shows the extent, but it would take much more space to tell its great value. With more of such friends it would be quite possible to make this Museum a great one, greater than any expensive exploring expeditions could achieve so far as specimens go, for no longer are these things to be had among the peoples who made and used them. Only in a few private collections made years ago exist the desiderata for our shelves. I am following many of these with anxious eye, but have not the funds needed to acquire them, and they will probably go to the rich museums of Europe that have a Government treasury behind them.

The accessions to the Library continue both as the result of exchange of publications and the purchase of books. In all cases the purchases are limited to the most pressing demands of a "working library" in a region so remote from scientific libraries. It will not be long before our library, now quartered in the upper gallery of Hawaiian Hall will require additional accommodation, all the cases made for books being now full to their utmost capacity. Neither will it be long before the opening of this upper gallery to the public must be considered, for the cases in the first gallery are nearly full. Closely connected with our library is the Museum Press soon to move into new and spacious rooms. The publications during 1909 were the Index to Fornander's Polynesians, by Mr. Stokes, issued as a special volume in small edition and not on our exchange list; this is considered a good example of indexing, and has proved of great use to many who

have used it. This was followed by the Annual Report, and the year closed with the publication of the fourth and last part of Volume II of the Memoirs, a brief history of the volcanoes Kilauea and Mauna Loa on Hawaii. Of course there has been the usual large amount of label work and the miscellaneous printing the Museum requires. It has been a great hindrance having the presswork done in town, and it will be a matter for early consideration whether we should not make better work in the new printery on a hand press; if the work is to still be done in town a much larger font of type should be provided, as forms are locked up and delayed in town beyond reasonable measure. Lest this should seem a reversion to ancient methods, let us remember that the finest work has always been done on the old hand press, and this is universally used for the proofs of the half tone engravings which form so large a part of modern illustration. The printing of a volume on Kapa-making has already been arranged, and it is thought that this will be ready during 1910 as Volume III of the Memoirs. The illustrations have many of them been made in Vienna in color and are faithful reproductions of the beautiful kapa still existing in this Museum and in the Director's private collection, which includes most of those Cook brought home. Unfortunately under the tariff these plates which will cost nearly five dollars a set, are subject to a duty of 25%, although they could not be made of such quality in America at present.

Department of Ethnology.

In the Department of Polynesian Ethnology Mr. J. F. G. Stokes, the Curator, has continued his studies of the curious Hawaiian fish-traps and conservation ponds and his results appear later in this series. Mr. Stokes has also spent some time on Molokai surveying the remains of the ancient *heiau* or temples, and while thus engaged found time to make collections of great value, among them a collection of plants and the curious and little known Kalaina wawae, specimens of which, given by Mr. George

P. Cooke, are now in the Museum and will be described later. Some other gifts have been received and are acknowledged in the list of accessions given below.

Department of Pulmonata.

Dr. C. M. Cooke, the Curator of Pulmonata, has made very extensive collections in his department and has spent much time on the Ancey collection. He reports: "Number of specimens collected or sent to the Museum for identification, 27,333. Catalogue numbers, 1347. The Thwing collection, numbering nearly 40,000, was purchased by the Trustees. It is hoped that the cataloging of this magnificent collection will be finished during 1910.

"Specimens have been received from Messrs. I. Spalding, C. N. Forbes, A. F. Knudsen, H. Podmore, W. H. Rice Jr., Judge C. S. Dole, A. F. Judd, C. H. Cook, E. Deverill, F. W. Terry and Dr. H. E. Crampton."

Department of Botany.

Mr. Charles N. Forbes has continued his good work in this Department of which he has now been appointed Curator, and this may be partly seen in his report. He also has an account of a new Hawaiian plant. His report is as follows:—"An excursion for the purpose of collecting and studying the vegetation of Kauai was made during the months of July, August and September. Four bases were established as follows: Hanalei, from which the region Kalalau and the power line trail was gone over; Lihue, from which the surrounding region was slightly covered; the McBryde mountain house and Mr. Gay's mountain house. Side trips were taken up Hanapepe and Olokele valleys. In covering so large a region in so short a time hardly more than a superficial survey could be made of any one place. About 500 different varieties were collected, and a good preliminary knowledge of the vegetation of the island was acquired. A large part of the success of the trip was due to the friendly interest shown by many of the people of Kauai, and especial thanks are due to Rev. J. M. Lydgate,

Judge C. S. Dole, Mr. Francis Gay and Mr. E. G. K. Deverill. The exploration of Oahu has been continued, essentially the same regions being covered as given in the last report.

"Most of the loose and unmounted material has been classified and incorporated into the Herbarium. Much trouble has been occasioned by small mites; and besides the preliminary fumigation which every specimen receives before being placed in the cases, the whole herbarium has been fumigated three times, twice with carbon disulphide and once with hydrocyanic acid gas, the latter method only proving effective. As the two rooms where the Herbarium is stored are small and tight, this method can be followed easily and with little danger.

"The Herbarium contains specimens of nearly every species so far reported from these islands, but contains no series illustrating the variations which are so striking on this group, and which are of the greatest importance to the modern botanist. Many of our specimens lack the exact localities from which they were taken, which are now recognized as of the utmost importance. For these reasons it would be advisable to increase our collections as rapidly as possible. The Herbarium consists of:—

The Mann & Brigham Herbarium 1864-5 (all groups)	909	
The General Herbarium:—		
Higher Plants.		
Hawaiian:		
Edw. Bailey Collection.....	267	
A. A. Heller Collection.....	317	
Other sources.....	287	1780
Duplicates and unmounted material.....	5000	5000
Exotics:		
New Zealand	183	
Australia	300	
Other Pacific Islands.....	349	
Miscellaneous	380	1304
Thallophytes (not yet arranged):		
Hawaiian.....	1991	
Exotic	480	2471
Making a total of.....		10,555

"The Director started an exchange with the Australian Botanic Garden in Sydney last year, and we have already exchanged 300 specimens. It is hoped that visits may be made to the other islands of this group, if for no other purpose than to keep up this valuable exchange. It would also be of advantage to extend these exchanges.

"Accessions during the year.—The following gentlemen have added specimens to the Museum: Dr. W. T. Brigham, 30 specimens, Maui; Dr. C. M. Cooke, 1 specimen, Oahu; Albert F. Judd Esq., 3 specimens, Hawaii; Rev. J. M. Lydgate, 78 specimens, Kauai; Mr. J. F. G. Stokes, 126 specimens, Molokai; Mr. C. B. Thompson, 5 specimens, Oahu; Mr. J. W. Thompson, 2 specimens, Oahu, 1 specimen, Molokai; Dr. E. V. Wilcox, 2 specimens, Oahu."

Mr. J. W. Thompson has continued his good work in making casts of the fish found in the Honolulu waters, and we have now over three hundred accurately colored casts. As may be supposed, the new fish are less and less frequent, and it will soon be necessary for our artist to visit the other islands of the group to obtain those specimens of the Hawaiian fish fauna that are peculiar to each of the islands.

The attendance of visitors during the year is shown in the table; there is a total attendance of visitors exceeding that of 1908 by 1940. When we examine the table by nationalities we find an increase of white visitors of 251, and of Japanese of 2133, the latter due to the presence of a training ship of that nation, when it seemed that nearly all both officers and men came to the Museum; of Hawaiians 246 less than the previous year.* The Trustees found it necessary to forbid the admission of children under five years of age, as women brought many babes in the arms and children too young to go alone, and spent the day, until the

*The small attendance during February was due to closing the Museum on account of oiling the roads in the yard; only those with permits from the office were admitted.

nursery noises and operations became a great nuisance, and the enforcement of the rule has been a great relief to visitors as well as to the staff; probably several hundred babies have been excluded, although cases have occurred where oriental mothers have claimed that unweaned babes were over five years old.

TABLE OF ATTENDANCE.

1909.	Whites.	Hawaiians.	Portuguese.	Chinese.	Japanese.	Others.	Open on		Visitors on closed days.	Average Attendance.		Total Visitors.
							Public days.	Other days.		Public days.	Other days.	
January	473	132	34	311	198	5	11	2	7	104	4	1153
February	137	2						6	139	23	23	139
March	356	65	13	9	18	8	4	12	223	62	19	469
April	453	247	56	164	529	26	9	8	372	123	46	1475
May	666	150	76	104	490	6	10	4	81	141	20	1492
June	292	93	33	74	1297	7	8	3	40	220	13	1796
July	525	65	16	53	662	19	10	6	68	127	11	1340
August	449	69	62	138	111	42	8	4	39	104	10	871
September	317	84	25	106	92	38	9	4	28	70	7	662
October	387	124	83	178	164	6	10	5	47	89	9	942
November	344	99	22	61	385	7	8	3	23	112	8	918
December	324	88	20	89	54	14	8	1	5	73	5	589
Totals	4723	1218	440	1287	4000	178	95	58	1072	113.4	18.5	11,846



List of Accessions.

ETHNOLOGICAL.

Gifts.

The Connelly collection of Australian material, presented to the Museum by the Hon. W. R. Castle of Honolulu. Made by Mr. John F. Connelly of Melbourne, Australia:—

- 9721-9755 Boomerangs, from all the states.
- 9756-9760 Coolardie or whirlers. Western Australia.
- 9761 Yinmarrie, ceremonial stick. Western Australia.
- 9762 Churinga, ceremonial stick. Western Australia.
- 9763 Dowak-mero, ceremonial stick. Western Australia.
- 9764 Mero, spear-thrower. Western Australia.
- 9765 Yinmarrie. Western Australia.
- 9766 Dowak-mero. Western Australia.
- 9767-9776 Mero. Western Australia.
- 9777 Stone club. New Guinea.
- 9778-9789 Clubs, Coondie and Nulla. Western Australia and New South Wales.
- 9790 Gin's club or yam stick, Wannah. Queensland.
- 9791-9792 Tomahawks. Western Australia.
- 9793-9794 Shields, Woondah. Western Australia.
- 9795 Shields, Helimon. New South Wales.
- 9796-9798 Wooden bowls, Coolamon. West and South Australia.
- 9799 Walking staff. New Zealand.
- 9800 Bead bracelet. Solomon Ids.
- 9801 War dress. Northern Australia.
- 9802-9813 Dresses and ornaments. Western Australia.
- 9814 Circumcision knife. Western Australia.
- 9815-9816 Stone chisels. Western Australia.
- 9817 Implement (? saw). New South Wales.
- 9818 Surgical implement. New South Wales.
- 9819 Skin dresser or burnisher. New South Wales.
- 9820-9822 Mill stones. New South Wales.

- 9823 Ax or adz head. New Guinea.
 9824-9825 Mill stones. New South Wales.
 9826 Adz or chisel. New Zealand.
 9827-9828 Mill stones. New South Wales.
 9829 Native cement. Western Australia.
 9830 Tomahawk. New South Wales.
 9831 Phallus or pestle. New South Wales.
 9832 Pounding stone. Victoria.
 9833-9835 Chisels. New Zealand.
 9836-9837 Tomahawks. New South Wales.
 9838-9839 Pounding or husking stones. New South Wales.
 9840 Native paint, Wilgie. New South Wales.
 9841 Pounding or husking stone. New South Wales.
 9842 Native paint. Western Australia.
 9843 Native flints. New South Wales.
 9844-9851 Stone spear heads. Western Australia.
 9852-9855 Glass spear heads. Western Australia.
 9856 Spear thrower. Western Australia.
 9857-9858 Jab sticks. Western Australia.
 9859-9860 Boolyah stones. Western Australia.
 9861 Kangaroo sinews. Western Australia.
 9862 Native cement. Western Australia.
 9863-9864 Message sticks, Wongi. Western Australia.
 9865 Native paint. Western Australia.
 9866 Spear thrower, Womerah. Queensland.
 9867 Police baton. Western Australia.
 9868-9893 Spears. Western Australia.
 9894-9901 " South Australia.
 9902-9904 " Queensland.
-
- 9698 Noa stone. Oahu. Given by Dr. C. Montague Cooke.
 9699 Grindstone fragment. Molokai. Id.
 9701 Hammer. Molokai. Id.
 9702 Hammer. Oahu. Given by Dr. Wm. T. Brigham.
 9708 Hammer. Molokai. Given by Mr. G. P. Cooke.
 9917 Mat. New Zealand. Given by Miss Ellen Sobey.
 9921 Sinker for upena uhu. Molokai. Given by A. F. Judd, Esq.
 9922 Hammer. Molokai. Id.

List of Accessions.

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- 9923 Fish hook. Molokai. Given by Mr. James Munro.
9924-9927 Small adzes. Molokai. Id.
9928-9929 Shell beads. Molokai. Id.
9931 Wand. Molokai. Id.
9935-9937 Sections of Kalaina wawae. Molokai. Given by Mr.
G. P. Cooke.

Purchases.

- 9670 Feather Cape.

Exchanges.

- 9905 Arm ring. Fiji.
9906 Girl's necklace. Fiji.
9907 Whale's tooth ornament. Fiji.
9908 Wooden bolt. Fiji.
9909 Cannibal fork. Fiji.
9910 Roll of sennit. Fiji.
9911 Fly Whisk. Fiji.
9912 Whale's tooth bolt for "Tiqua". Tonga.
9913 Breast ornament. Tonga.
9914 Fish hook. Tonga.
9915-9916 Dilly bags. Australia.

Collected.

- 9703 Offerings from a fish altar. Molokai.
9707 Offerings from Kaliuwaa gulch. Oahu.
9918 Carved stone. Molokai.
9932 Ulumaika. Molokai.
9933 Polishing stone. Molokai.
9934 Squid sinker. Molokai.

GEOLOGICAL.

- 9671-9685 Well borings. Honolulu. Given by Mr. J. R. Ward.
9686-9690 Lava stalagmite. Kilauea. Given by Rev. W. D.
Westervelt.
9691 Lava deposited on tree branch. Id.
9692 Ferns charred by lava. Id.
9700 Hematite. Molokai. Given by Dr. C. Montague
Cooke.

9704	Kaolin. Molokai. Given by Miss Ellen Sobey.
9705-9706	“ “ Given by A. F. Judd, Esq.
9909-9910	Weathered basalt. Molokai. Collected.
9939	Basalt. Molokai. Collected.
9939-9947	Sandstone. Molokai. Collected.
9948	Kaolin. Molokai. Collected.

RELICS.

Given by Hon. A. S. Cleghorn, ex-Governor of Oahu.

9531	Gold watch, once the property of His Highness Charles Kanaina.
9532	Silver watch, given by the British Government to Governor Kekuanaoa in 1824.
9533	Gold watch, belonged to Hon. Mrs. Bishop.
9534	Gold watch, belonged to Her Royal Highness Victoria Kamamalu.
9535	Gold watch, belonged to Her Royal Highness Likelike.
9536	Gold watch, belonged to Her Royal Highness Kaiulani.
9537-9538	Silver bowl and spoon, belonged to H. R. H. Kaiulani.
9539	Silver powder box.
<hr/>	
9697	Piece of U. S. S. "Vandalia." Given by Mrs. W. F. Allen.

MISCELLANEOUS.

9696	Exhibit of threads from cotton raised on Oahu in 1865. Given by Mr. James W. Robertson.
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ADDITIONS TO THE LIBRARY.

Accessions denoted by an * were acquired by exchange.

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Baltimore, Md.—Johns Hopkins University.
Maryland Geological Survey.
Barcelona, Spain.—Real Academia de Ciencias y Artes de Barcelona.
Berkeley, Cal.—University of California.
Berlin, Germany.—Anthropologische Gesellschaft.
Königl. Museum für Völkerkunde.
Berne, Switzerland.—Bern Historisches Museum.
Boston, Mass.—Boston Public Library.
Boston Society of Natural History.
Museum of Fine Arts.

- Bremen, Germany.—Museum für Natur-, Völker- und Handelskunde.
 Brisbane, Queensland.—Royal Society of Queensland.
 Brooklyn, N. Y.—Museum of the Brooklyn Institute of Fine Arts and Sciences.
 Brussels, Belgium.—Société Royale Malacologique de Belgique.
 Buda-Pest, Hungary. Museum National Hongrois.
 Buenos Aires, Argentine Republic.—Museo Nacional de Buenos Aires.
 Buitenzorg, Java.—Jardin Botanique de Buitenzorg.
 Calcutta, India.—Asiatic Society of Bengal.
 Indian Museum.
 Cambridge, Mass.—Harvard University Library.
 Museum of Comparative Zoology.
 Peabody Museum.
 Capetown, S. Africa.—South African Museum.
 Chicago, Ill.—Field Museum.
 Christchurch, N. Z.—Canterbury Museum.
 Cologne, Germany.—Rautenstrauch-Joest Museum.
 Copenhagen, Denmark.—Société Royale des Antiquaires du Nord.
 Dresden, Germany.—Königl. Zoologisches und Anthropologisch-Ethnographisches Museum.
 Dublin, Ireland.—Royal Irish Academy
 Edinburgh, Scotland.—Royal Society of Edinburgh.
 Florence, Italy.—Società Italiana di Antropologia.
 Frankfurt on Main, Germany.—Städtisches Völker-Museum.
 Geelong, Victoria.—Gordon Technical College.
 Genoa, Italy.—Museo Civico di Storia Naturale di Genoa.
 Halle, Germany.—Kaiserl. Leop. Carol. Akademie der Naturforscher.
 Hamburg, Germany.—Museum für Völkerkunde.
 Hanover, N. H.—Dartmouth College.
 Hilo, Hawaii.—Hilo Public Library.
 Honolulu, Hawaii.—Hawaiian Evangelical Association.
 Hawaiian Historical Society.
 Hawaiian Sugar Planters' Association.
 Honolulu Library Association.
 Oahu College.
 United States Experiment Station.
 Lawrence, Kansas.—University of Kansas.
 Leiden, Holland.—Rijks Ethnographisches Museum.
 's Rijks Museum van Natuurlijke Historie.
 Leipzig, Germany.—Museum für Völkerkunde.
 Liverpool, England.—Liverpool School of Tropical Medicine.
 London, England.—Linnean Society of London.
 Royal Anthropological Institute.
 Madras, India.—Government Museum.
 Manila, P. I.—Bureau of Science.
 Ethnological Survey.
 Melbourne, Victoria.—Royal Society of Victoria.
 Mexico.—Instituto Geológico de Mexico.

- Munich, Germany.—Ethnographisches Museum.
New Haven, Ct.—Connecticut Academy of Arts and Sciences.
Yale University Library.
New Plymouth, N. Z.—Polynesian Society.
New York, N. Y.—American Museum of Natural History.
Columbia University Library.
New York Botanical Garden.
Oberlin, O.—Oberlin College.
Para, Brazil.—Museu Goeldi.
Paris, France.—École d'Anthropologie.
Société d'Anthropologie.
Philadelphia, Pa.—Academy of Natural Sciences of Philadelphia.
American Philosophical Society.
Free Museum of Science and Art.
The Philadelphia Museums.
University of Pennsylvania.
Wagner Free Institute of Science.
Pietermaritzburg, South Africa.—Natal Government Museum.
Pittsburg, Pa.—Carnegie Museum.
Plymouth, England.—Marine Biological Association of the United Kingdom.
Rome, Italy.—Accademia dei Lincei.
St. Louis, Mo.—Missouri Botanical Garden.
Salem, Mass.—Peabody Academy of Science.
San Francisco, Cal.—California Academy of Sciences.
São Paulo, Brazil.—Museu Paulista.
Stanford University, Cal.—Leland Stanford Junior University.
Stockholm, Sweden.—Kongl. Vitterhets Historie och Antiquitets Akademien.
Sydney, N. S. W.—Australian Museum.
Department of Agriculture.
Department of Fisheries.
Department of Mines.
Linnean Society of New South Wales.
Royal Society of New South Wales.
Technological Museum.
Tufts College, Mass.—Tufts College.
Vienna, Austria.—Anthropologische Gesellschaft in Wien.
K. K. Naturhistorisches Hofmuseum.
Wanganui, N. Z.—Public Museum.
Washington, D. C.—Bureau of American Ethnology.
Carnegie Institution of Washington.
Library of Congress.
Smithsonian Institution.
United States Geological Survey.
United States National Museum.
Wellington, N. Z.—New Zealand Institute.

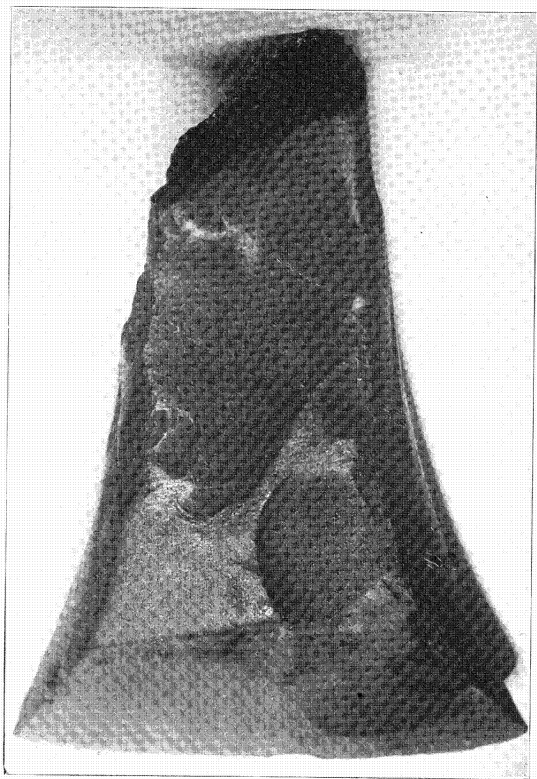


FIG. 1. CURVED STONE ADZE. (OBVERSE.)

Hawaiian Curved Adzes.

BY WILLIAM T. BRIGHAM.

It has long been a puzzle to me how the ancient Hawaiians cut the bottom of their canoes on the inside so evenly curved: it seems possible only on the supposition that polishing stones were used to grind down the irregular cut of the common adze which seldom has a face of more than two inches in width. In the extensive collection of stone adzes in this Museum there is not one that a modern carpenter would have selected for cutting a canoe bottom. I had seen the old-time canoe makers wield the clumsy looking stone adze (after cutting the rough work with a foreign steel adze) with a skill and certainty difficult to acquire, leaving the outside of the canoe with a fairly smooth surface, but I never happened to meet one working on the inside, which was generally left to the last.

Anyone who has seen the procedure of bailing out a genuine native canoe with a fragment of gourd umeke will understand the importance of a smooth, evenly curved bottom. It was gratifying to find at last a tool capable of doing what seemed needed in fashioning such a bottom. During the past year Mr. William Wagener has brought to my notice an adze found by him in Hamakua, Hawaii. To him it was a rare form, as he had seen only one other, and he deposited it in this Museum for study and casting. As will be seen in Fig. 1, the shank has been broken (recently) and there are a few nicks in the cutting edge, but the finish is careful and complete. If we allow for the broken shank its weight would exceed 4.5 lbs. Its peculiarity consists in the double curve of its cutting edge which is beautifully regular. The stone is dark-blue phonolite with a brown oxydized surface. Weight 3 lbs. 9 oz.; breadth 5.7 in.; length 8.2 in. (10.2 when entire?); thickness 2 in. (Figs. 1 and 2.)

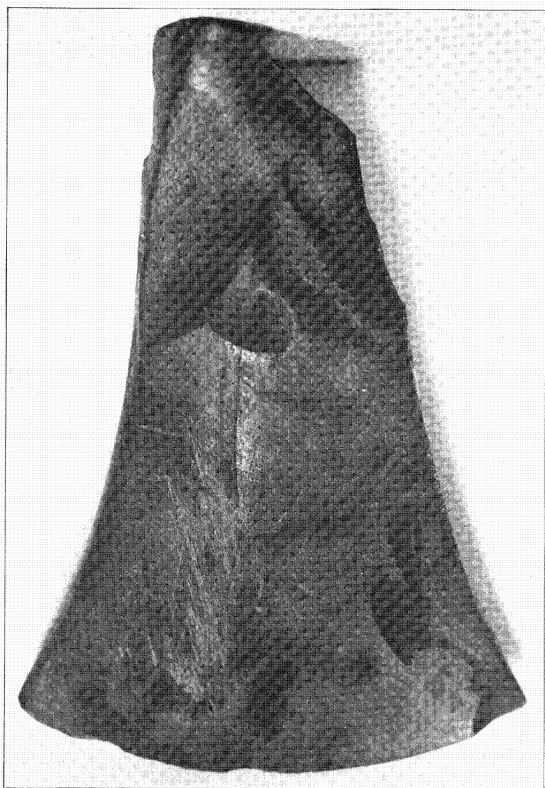


FIG. 2. CURVED STONE ADZE. (FRONT.)

Notes on Hawaiian Petroglyphs.—I.

BY JOHN F. G. STOKES.

DURING the past four years the writer has at different times collected data on Hawaiian petroglyphs and had planned, at some future date when the material gathered seemed complete enough, to prepare a paper on the subject or place the information gleaned in the hands of a more able person for the same purpose. The manifold duties of a member of a small museum staff have so largely interfered with the carrying out of these plans that the time of their consummation is too indefinite; and rather than keep from students of Hawaiian ethnology the information that should be theirs, the knowledge so far gained is submitted herewith as No. 1 of a series in which it is hoped to publish from time to time as discovered or communicated unrecorded data on the subject.

The first observer to record petroglyphs on these islands was Mathison¹ who in 1822 saw a pictured stone on Oahu. The following year Ellis² frequently saw along the southern coast of Hawaii "a number of straight lines, semicircles or concentric rings, with some rude imitations of the human figure cut or carved in the compact rocks of lava." Fornander³ observed them on a hill at Kalae, Molokai, but appeared to see in them only an evidence of phallic worship. Krämer⁴ saw a number on the same hill and illustrated several of the figures. At this same time (beginning of 1898) Farley⁵ recorded his observations on the numerous petroglyphs occasionally uncovered by storms on the beach at Koloa, Kauai. Two years later Thrum⁶ published an account of a dis-

¹ Mathison, Gilbert Farquhar. *Narrative of a Visit to Brazil, Chile, Peru and the Sandwich Islands*. London, 1825. p. 403.

² Ellis, Rev. Wm. *Narrative of a Tour through Hawaii*. London, 1826. p. 431.

³ Fornander, Abraham. *The Polynesian Race*. London, 1875-82. Vol. i, p. 50.

⁴ Krämer, August. *Der Phallusberg der Molokai* (*Der Globus*, lxxiii Band, S. 8). Braunschweig, 1898.

⁵ Farley, J. K. *The Pictured Ledge of Kauai*. *Hawaiian Annual for 1898* (Thos. G. Thrum, publisher). Honolulu, 1898. p. 119.

⁶ *Hawaiian Annual for 1900*, p. 126.

covery at Koko Head on Oahu, and in 1904 appeared a more extensive article containing new, and an excellent review of previous observations by A. F. Judd.⁷ The latest reference which has come under the writer's notice is the interesting article on "The Pictured Rocks of Naalehu" by the Rev. W. D. Westervelt⁸ in 1906.

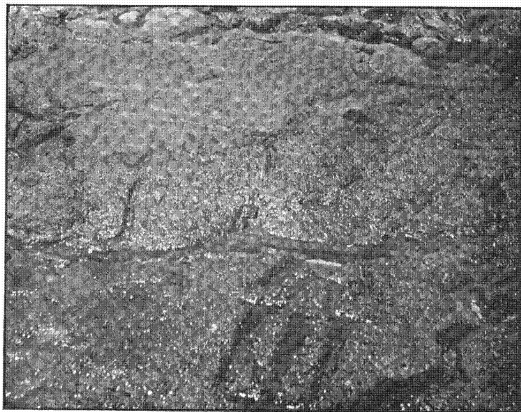


FIG. 1. PETROGLYPHS AT KAHALUU, NOT CHALKED.

The following notes were mainly gathered during the writer's journeys round the islands of Hawaii in 1906 and Molokai in 1909 while surveying the ancient places of worship and collecting available data for the assistance of the Director in his proposed monograph on Hawaiian heiau, under a grant from the Carnegie Institution of Washington. Since the object of the expeditions was as just outlined and the travelling expenses were defrayed by the Institution, the writer did not feel at liberty to give as much

⁷ Rock Carvings of Hawaii. Hawaiian Annual for 1904, p. 179.

⁸ Hawaiian Annual for 1906, p. 164.

time to the subject of petroglyphs as he would have desired, or have taken, had the expedition been entirely financed by the Bishop Museum. In addition to these notes are included illustrations of petroglyphs gathered by Mr. Judd since his last paper, and kindly given to the Museum.

Kona, Hawaii.—The attention of the writer in the field was first drawn to petroglyphs at Kahaluu, near the heiau of Keeku, by information from a native that there was a picture on the beach. As the tide had ebbed, an examination was made of the remains



FIG. 2. PETROGLYPHS AT KAHALUU, LOOKING WEST.

of an ancient lava flow extending seaward about two hundred and fifty feet from the beach, and at a point about twenty-five feet from the sand was a doubly outlined petroglyph (Fig. 1), representing a headless human figure, cut into a smooth part of the lava to a depth of .5 inch. The guide said it was Kamalalawalu. Around it in all directions were numerous faint single-lined figures (Figs. 2, 3) which the native appeared to see for the first time, and which he suggested were Kamalalawalu's men. Preparations were at once made to photograph the figures, but as it was believed that none of them except the first mentioned were deep enough for the faint grooves to be detected by the camera, a mixture of

white lead and kerosene was tried, there being no prepared paint available. Great care was given to the outlining of these figures, and when they were incomplete, either through erosion by the sea or possibly for the reason that the work had been left unfinished by the artist, no exercise of the imagination was permitted to interfere with the presentation of anything but the parts which



FIG. 3. PETROGLYPHS AT KAHALUU, LOOKING NORTH-EAST.

could be clearly traced. The paint mixture was not successful, and later a thin line of chalk along the middle of the grooves was found amply sufficient.

All the figures except that of Kamalalawalu were rather smoothly and evenly graded in thin rounded channels of a general width of .4 inch and a depth of .1 inch. The heads of the smaller ones when not outlined were cup-marks of about .3 inch in depth; and of the larger, flat and shallow depressions of the same depth as the outlines of the figures. They were probably made by hand-

mering or pecking with a beach pebble, as the measurements of the grooves might indicate. Previous observers have been wont to refer to the native stone adze as the cutting implement for the petroglyphs they were describing, but even if the stone adze could keep its edge when cutting into stone strata sometimes as hard as itself, there is nothing in the petroglyphs or within reason to de-

FIG. 4.

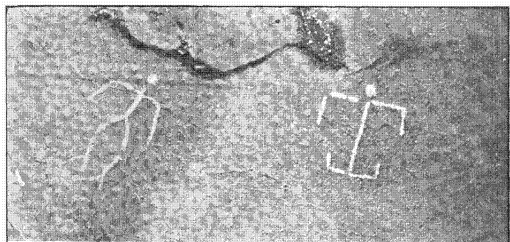


FIG. 5.

monstrate why the workers should ignore a simple and effective tool like a pebble, which they could obtain anywhere without effort, in favor of the laboriously wrought stone adze. Dr. Brigham² has demonstrated the facility with which the natives could use the beach pebbles when working in stone, and the writer has seen natives of today hammer out their names or initials on a flat rock, in neat and symmetrical letters, with nothing but a small stone

²Hawaiian Stone Implements, Mem. B. P. B. M., vol. i.
[261]

picked at random. It should also be mentioned that this work would be done in a surprisingly short time, and when finished the grooves would have measurements corresponding proportionately with the greater number of petroglyphs so far seen. In the ancient work the channels may have been rubbed down, in place of being hammered, or smoothed by rubbing after abrading with the hammer, but after an examination of the initials and names above mentioned, no need for any smoothing process could be seen. In referring to the figures below, the measurements given are of the length, taken from photographs, and are approximate.

Leaving the narrow sandy beach, and proceeding westward the first petroglyph (Fig. 2) met is incomplete, representing either the shoulders and arms or the wide-spread legs of the human figure. Next, in the same order, are two forms (Fig. 4) close together which are unlike any others so far observed; the first, length 10 inches with squared joints, has a very peculiar upward turn at the knees, which posture is difficult to explain. The second, length 13 inches, has proven unique in these investigations so far on account of the fact that the rock at the knees has not been abraded and is on the same level as the original surface; the contiguous outline of the figure was very distinct. It probably was intended to portray some person or object with broken legs. Another point of peculiarity was the two-pronged feet—when the foot is represented at all it is generally by a single line at an obtuse angle to the part of the leg adjoining. A little to the north is the figure of an orator or a spear thrower (Fig. 6). The next couple of figures, 13 and 15 inches long, have the heads outlined, and the smaller has two small punctures for the eyes (Fig. 5). The last, in place of the usual central line for the trunk, has a curve to represent the chest or breast.

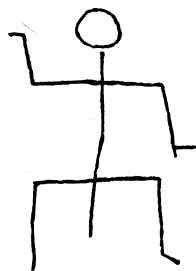


FIG. 6.

The pictures of the interesting quartet in the foreground of Fig. 7. are no doubt an attempt to portray the happenings at an obstetrical case; the figures are grouped together and are slightly removed from the rest of the pictures. Kahaluu, from its superior natural advantages, was the abode of many chiefs and kings

(as the number of heiau in the vicinity would indicate), and this group may well have been intended to record the not uncommon occurrences in Hawaiian history such as mentioned by Fornander¹⁰ in vol. ii, pp. 204 and 260. The length of the figures is 30, 18 and 20 inches.

To the south-west of the last group is another of three figures with rounded limbs placed in a row (Fig. 8). It has been not inappropriately suggested that these were three dancers, the arms of



FIG. 7.

the smallest figure being properly placed for some of the movements of the *hula*. To the north and west are numerous other figures which have probably been added after the completion of the last group. However, there is nothing in the appearance of the gravings to be ascertained as to the comparative age. One figure should be noticed with the line of the trunk transversely broken by a segment of a circle (Fig. 9). The outlined-headed figure has its right foot connected with a small figure, 11.5 inches

¹⁰ Polynesian Race.

long, depicted with a rectangular abdomen (Fig. 10). The headless figure directly below is 10.5 inches long. A little more to the west than the last is a curved-limbed figure with a broken-lined trunk and a line between the feet suggestive of a skirt (Fig. 11). In a number of cases the males are definitely marked, leaving it open to the suggestion that the unmarked figures must be females. But considering the number of unmarked figures, it does not seem

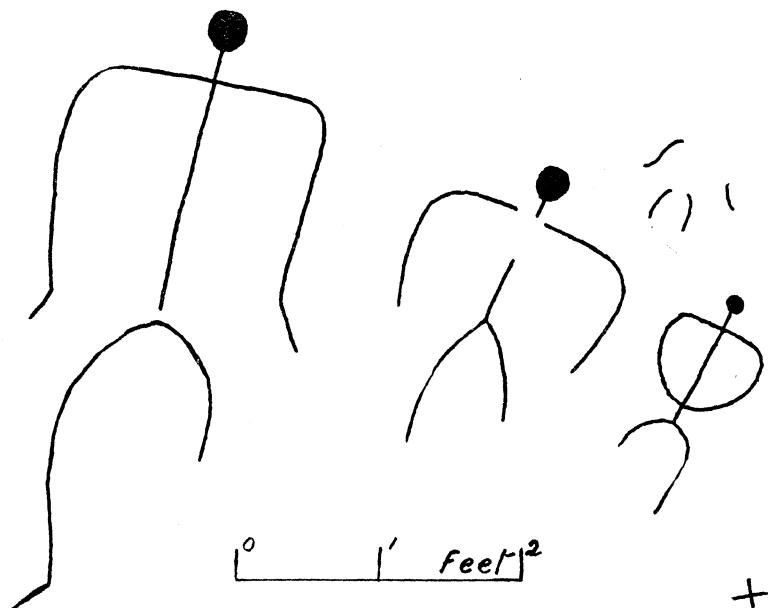


FIG. 8.

reasonable to conclude that all these were females. Nevertheless the Hawaiians were children of Nature and were accustomed to regard her as she is. The woman's dress was the pa'u, a wrapping of tapa extending from the waist to the knee.

To the west of the hula group is a jumble of petroglyphs, the most interesting being the deeply incised figure of Kamalalawalu (Figs. 1, 12 and 13). It is more than probable that this figure was not always beheaded, as outlines of what may have been the lower part of the head are still traceable. Where the head should be there is a natural crack in the bed-rock which seems to have

occurred since the graving of this and the surrounding carvings. It is believed that the Hawaiians did not practise decapitation. The figure is 10.5 inches long, with trunk and limbs represented by double lines of grooves .9 inch wide and .5 inch deep. At its foot is a male figure with head and body outlined, the latter in oval form. On the east, other incomplete figures adjoin, one with an outlined head and dotted eyes and nose.

To the north of Kamalalawalu (Fig. 12), is another of the figures with an upraised arm, while to the west of the last is

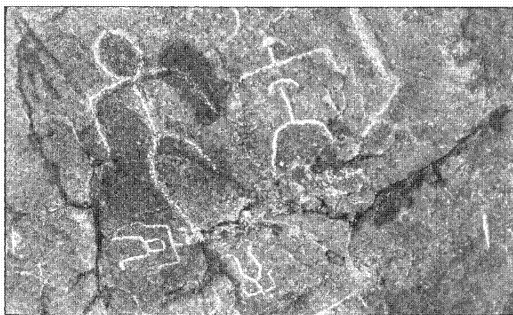


FIG. 9.

apparently a figure in profile. Petroglyphs in profile are so unusual¹¹ that it might be safer to consider this one incomplete, or the remains of one that has been worn down by the waves. Still further to the west is a graving (Fig. 14) 40 inches long which from peculiarities of its outline might at first seem modern. However, the graving is similar in all respects to those described above. Part of the head was seen, but does not show in the photograph. The abdomen is roughly rectangular with four upright or slanting strokes on the upper side. The feet are circles.

¹¹Certain stone carvings in profile have been previously referred to on pages 124 and 125 of this volume.

To the west and south-west of Kamalalawalu are other lined figures one of which (Fig. 15) is a phallic emblem, 21 inches long, which certainly does not seem modern. Through the fogging of the films, it has been necessary to trace these outlines.

To the south of the last is a male figure (Fig. 16) with two parallel disconnected lines for the trunk, and feet or toes represented by three disjointed strokes.

To the north and north-west, along the edge of the low mound of lava on which the petroglyphs were found, were other carvings

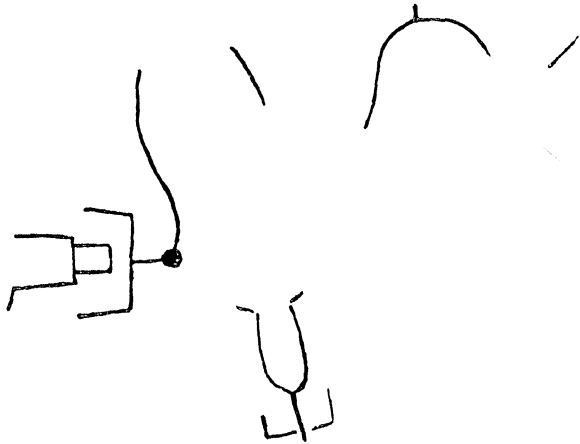


FIG. 10.

(Figs. 17 and 18). One (Fig. 18), 33 inches long, had a flat shallow depression for a head, forearms turned inward and hands downward. No legs could be traced, but the trunk was represented by a long line interrupted by cup-marks, and a design the purport of which is now indefinite.

On another swelling of lava to the west (Figs. 19 and 20) is a very large unfinished figure; while some distance to the south is an attempt at another, with part of a name below it. These are unquestionably modern as the graving is very different from that described above, the peckings being still distinctly seen and the channels anything but smooth. They were, judging from appearances, made with a steel implement (perhaps a pick) the scars from which have been slightly rounded by the waves.

Nearer the sea than the last mentioned is an artificial bowl 8×3.5 inches cut in a flat rock, the use of which was not apparent.

The petroglyphs at Kahaluu lay pointing in all directions, but the majority headed towards the land, perhaps because it was more comfortable for the worker to face the mountains than the



FIG. 11.

sea, or that the lava sloped upwards towards the shore. Nor was there much uniformity in the style of workmanship, only in some of the isolated groups of two or more figures did it appear that one artist had been responsible for more than one petroglyph.

It will have been seen from the illustrations that the commoner forms at this place were figures with small cup-marked

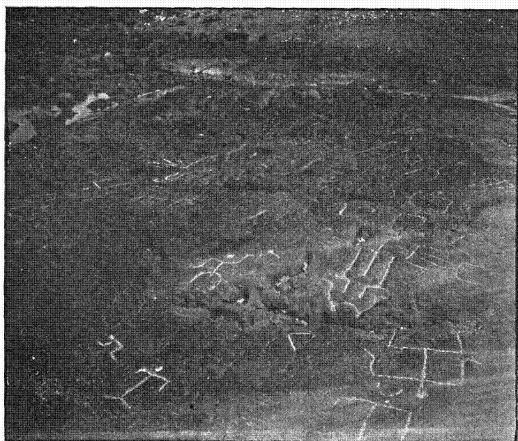


FIG. 12.

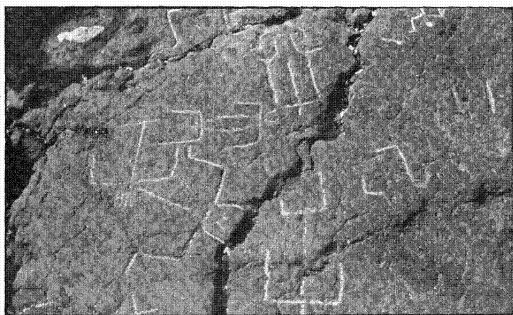


FIG. 13.

heads, single-lined bodies and angular or curved joints, which from present recorded discoveries might be called the typical forms. The triangular-bodied and four-legged figures were absent.

At the time of these investigations there was living in Kahaluu an old native named Malanui, eighty-six years of age, who, after

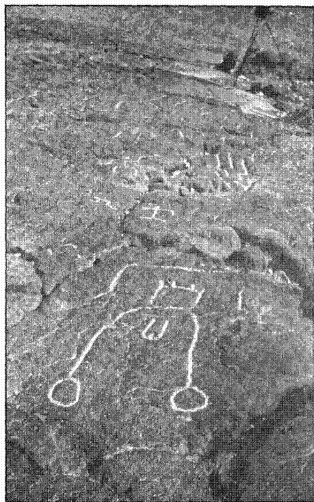


FIG. 14.

the petroglyphs were marked, led the writer to the beach and pointed out the figure of Kamalalawalu. The other petroglyphs, when his attention was called to them, he declared he knew nothing of, and offered no suggestions. The following bit of history had been previously communicated by him, and is confirmed in part by Fornander.

When Kamalalawalu, king of Maui, invaded Hawaii, Lono-ikamakahiki the king of Hawaii was in Kahaluu. On hearing of

the landing near Kawaihae bay, Lono held a council of war at which two old priests presented the following plan: Lono was to disgrace them and drive them from court; they were to seek refuge with the enemy and confidence being gained advice was to be given that a march be made inland toward Waimea where they were to claim that Lono was in such a weak position that his defeat was certain. The plot succeeded, and while Kamalalawalu marched inland, Lono brought his forces along the coast from Kahaluu and cut off the retreat. Kamalalawalu was killed in the engagement that ensued. His body was brought to Kahaluu, a

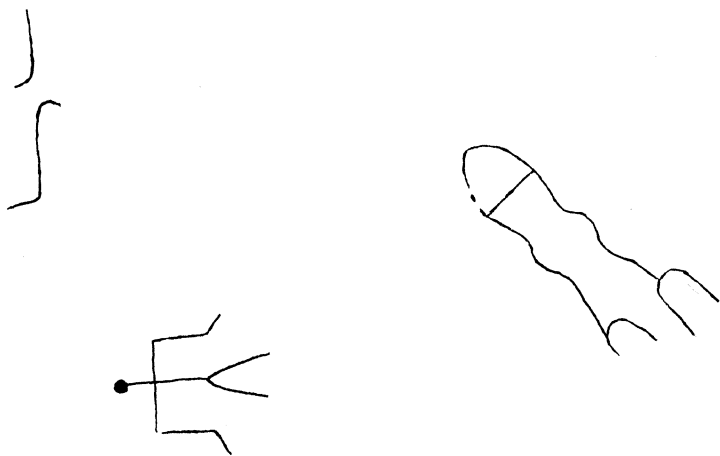


FIG. 15.

picture of it made on the rock, and the body sacrificed in the nearby heiau of Keeku.

Fornander's account¹² of the main facts of the invasion is similar. Thrum,¹³ who has been gathering legendary lore during the past forty years, has gleaned several accounts referring to the sacrifice—one, that it took place at the heiau of Ohiamukumuku, a quarter of a mile from Keeku; another that the Maui king was killed at Ohiamukumuku and his bones burned at Makole'a, another heiau one hundred yards from Keeku. The second was discredited by Thrum on account of other information which he had to the effect that the bones were saved and later returned to

¹² Polynesian Race, vol. ii, p. 123.

¹³ Hawaiian Annual, 1908, pp. 71 and 72.

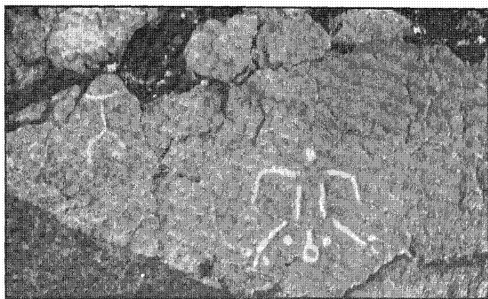


FIG. 16.

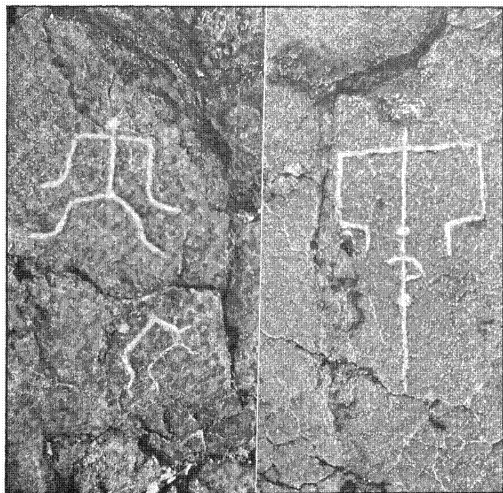


FIG. 17.

FIG. 18.

Maui. Thrum also has information to the effect that the heiau of Keeku was purported to have been built by Kamehameha I, about two hundred years after the time of Lono-ikamakahiki.

Malanui was the grandson of the last priest of the neighboring heiau of Kapuanoni and was the only man met on Hawaii

FIG. 19.

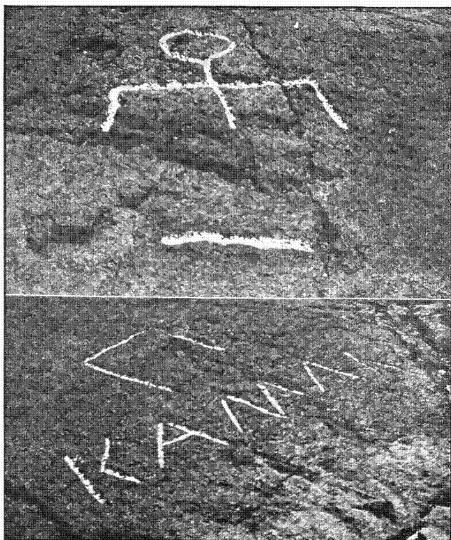


FIG. 20.

who could then give any information on the details of a heiau. He said that his knowledge was imparted to him by his grandfather and father. I have no reason to doubt the man's sincerity, as he was a Hawaiian of the old type, who neither drank nor smoked and was highly regarded by the other natives. On offer-

ing him a tip in as delicate a way as possible, he was much offended and explained that he gave me the information because he wished to assist the stranger, and begged me not to repeat the offer. He had lived in Kahaluu all his life. He also told me that King Kalakaua had tried to break off some of the petroglyphs to take them to Honolulu. A large quantity of rock had been removed from the swelling of lava on the land side, but there were no marks on the broken edge of cold chisels or steel tools, which would probably have been used for the work thirty years ago. It should be mentioned that the natives then living at Kahaluu referred to the figure of Kamalalawalu by that name.

At Palemano Point, Keei, near the Heiau of Kamaiko and on the lava at the south side of Kealakeakua Bay, a petroglyph was found (Fig. 30, E) when searching for a triangulation station. This figure was hammered in much broader lines than usual; the channels were smooth, but the impression gained was that it was a modern piece of work.

When at Honaunau, many enquiries were made for the pictures on the rocks, and a story was told of a number of stars being carved on an immense upright slab, which had since been overturned by a tidal wave and then lay pictured side down. Farley¹⁴ mentions petroglyphs at Honaunau representing Kamalalawalu and his dogs, but after many enquiries without success, the writer concluded that there had been confusion in the localities of Kahaluu and Honaunau, especially as Farley also said that Kalakaua tried to remove some. However, a number of people have since been met who have seen the gravings. Dr. N. B. Emerson of Honolulu described them to the writer as having triangular bodies.

Kau.—At Ka Lae, the south cape of Hawaii, no petroglyphs were seen, but information had previously been received from Mr. J. S. Emerson, formerly a government surveyor, that holes had been drilled by the natives in the rocks at the water's edge to provide moorings for their canoes. Each mooring was found to consist of two conical holes drilled near the edge, on the top and side of a boulder, at right angle to each other and meeting at about 2.5 inches from the surfaces. The holes tapered inward from a

¹⁴ Hawaiian Annual, 1898, p. 124.

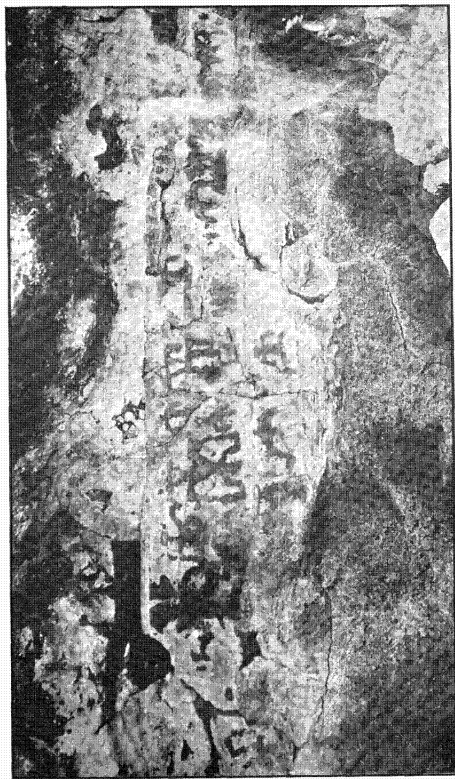


FIG. 21. PETROGLYPHS AT NAALFCHU.

diameter of 2.5 inches to .5 inch, where they met. Four pairs of finished holes were seen, and one partly drilled.

In a cave on a mountain a little to the north-west of Waiohinu petroglyphs were reported, but the native engaged as a guide failed to appear, and consequently these were missed.

About two miles to the south of Naalehu on the east wall of a lava tunnel were found the petroglyphs (Figs. 21, 22) described by Westervelt.¹⁵ The graving had been done by chipping away

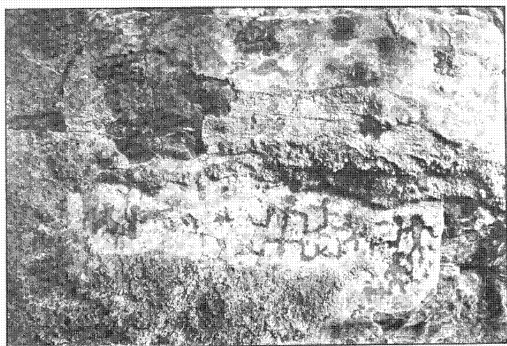


FIG. 22.

the white deposit on the surface of the black lava walls. This deposit, when hammered, crumbled irregularly, on account of which perhaps the workmanship lacked the symmetry and even finish noted at other places. Besides the more common single-lined forms, some with outlined and solid bodies may be noticed. In the middle of Fig. 22 may be seen a petroglyph of a male with three-toed feet. To the right of the middle of Fig. 21 are three short parallel strokes—an unusual occurrence, but noted elsewhere by Judd and Krämer.

¹⁵Hawaiian Annual, 1906, p. 164.

Scattered along the low lava shore between Ninole and Punaluu, and above the sea, were several small petroglyphs of the more common form. About two miles east of Punaluu and one hundred yards from the sea were several scattered groups (Figs. 23-28) within a radius of fifty feet, and not more than one

FIG. 23.



FIG. 24.



FIG. 25.

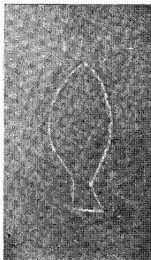


FIG. 26.



FIG. 27.



FIG. 28.

PETROGLYPHS NEAR PUNALUU.

hundred and fifty feet from the trail. They had been graven to a depth of .15 inch in the smooth portions of an old lava flow. The grooves were not smooth, the surface being brittle. Here for the first time the writer met with a definite animal form, in the figure of a fish 18 inches long (Fig. 25). A circle, 8 inches in diameter was also seen. It was this coast that Ellis referred to when describing the petroglyphs he saw, but the writer was not fortunate enough to find any of the semicircles or concentric rings. The

carvings at this place were few, but novel. In Fig. 23 is one, 30 inches long, with five-fingered hands sheltering three small abnormally fashioned glyphs; at the base of its neck was a distinct line stretching above its right shoulder. It might tell the story of a large and valiant man struck with a spear while defending his children or less capable fellows. Another, Fig. 24, with its lower half omitted, reached down with a four-fingered hand in the direction of a pair of children. Two other petroglyphs in this en-

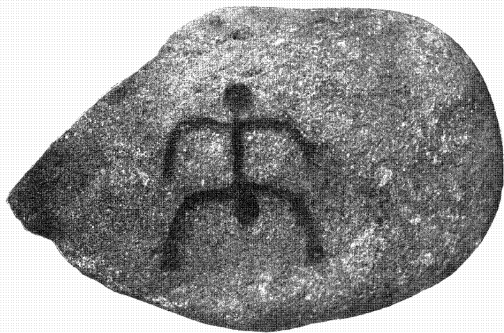


FIG. 29.

vironment, Fig. 27, 16 inches long and Fig. 26 are peculiar from the fact that eyes were represented without head outlines. The ancient native trail leading past this spot to Punaluu crossed a flow of *aa*. To add to the comfort of the barefooted traveler, a line of smooth water-worn stones had been placed on the sharp clinkers about two and one-half feet apart. On one of these stones a small graving was seen (Fig. 29). It is now in the Bishop Museum. The figure is of a common form, length 7 inches, but graved in shallower channels than is usual—only .05 inch deep. The head is .2 inch deeper. The slight depth may be accounted for by the extremely hard surface of the stone. To make the petroglyph distinct in the photograph, the finger was wetted and passed along the grooves of the figure before exposing the plate.

After leaving Punaluu, the writer passed through Pahala, but time was too limited to allow a search for, and examination of the petroglyphs discovered by Mr. Walton at the latter place to be made. However, Judd describes and illustrates a number of them.

Puna.—On the lower trail from Kau is a footprint, 16 inches long, clearly cut to the depth of .4 inch. It is well proportioned and shows the wide-spreading toes of the native foot undeformed by boots. It is known as Nihau's foot. A few other gravings were found near the spot, one to the south and off the road (Fig. 30, A), and three others along the trail to the east (Fig. 30,

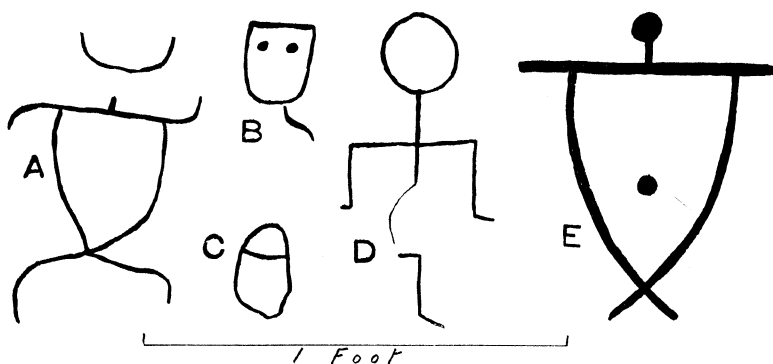


FIG. 30.

B, C and D). Continuing on the trail, distinct, but not very deeply cut, marks were observed which might have been intended for the chart of a constellation (Fig. 31). The group was about six feet long. Fornander frequently mentions that the Hawaiians had more than a passing knowledge of the heavenly bodies.

It had been reported that petroglyphs were to be seen at the heiau of Kukii in Kapoho, but Mr. Henry Lyman, who had spent a great part of his life at that place, had not seen them. However, he kindly showed me a natural crack in a rock, which he told me a previous visitor had claimed was an Aztec character.

Hilo.—Mr. Rufus Lyman informed the writer that on the Wailuku river, to the east of the "Potholes," an old native had shown him marks which were intended to represent the sun, moon

and stars. This was more than thirty years ago, and to reveal them it was then necessary for the native to remove the earth and vegetation from the ledge of stone forming the bank of the stream. While working in the neighborhood the writer made an unsuccessful search for them.

Kohala.—At Puuanahulu in South Kohala, when passing along a trail late one afternoon, the remarkable sight of a couple of acres of pahoehoe closely covered with petroglyphs was experi-

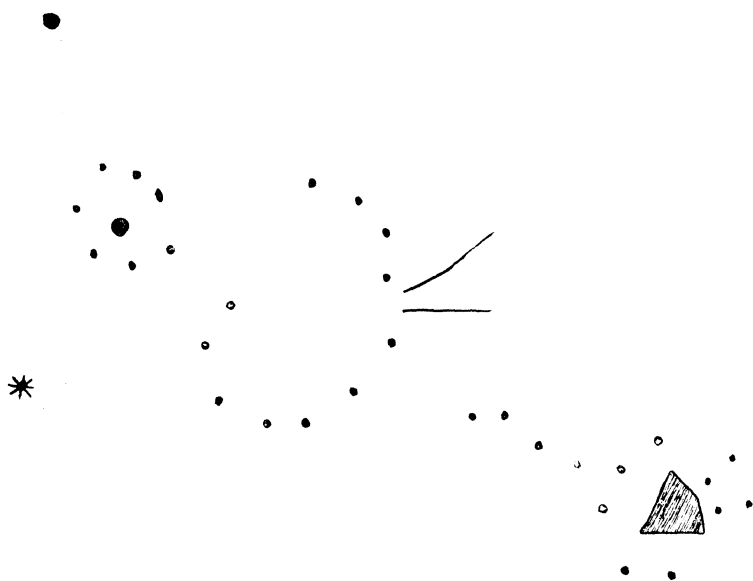


FIG. 31.

enced. The failing light necessitated time exposures with the camera, and as many photographs were taken as the few available minutes would permit (Figs. 32-39). Most unfortunately the time limit of the expedition had been reached and the writer knew that it would be impossible to return to the spot during that season. He was therefore reluctantly compelled to content himself with a very brief survey of the most interesting field before him and the intention to return and carry out an extended investigation at the earliest opportunity.

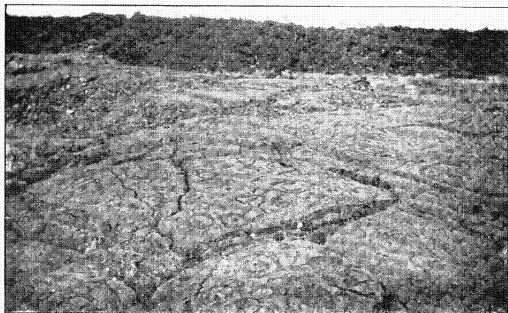


FIG. 32.

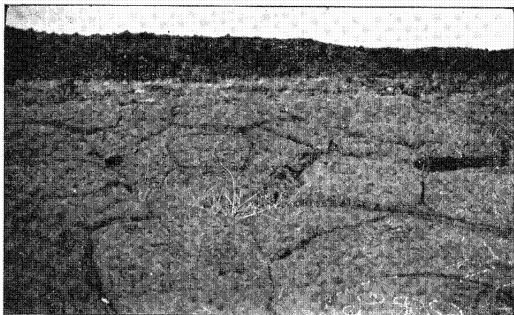


FIG. 33.

PETROGLYPHS AT PU'ANAHULU.

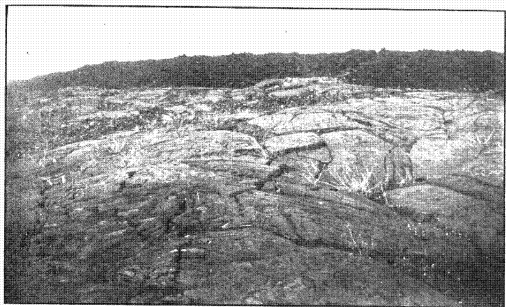


FIG. 34.

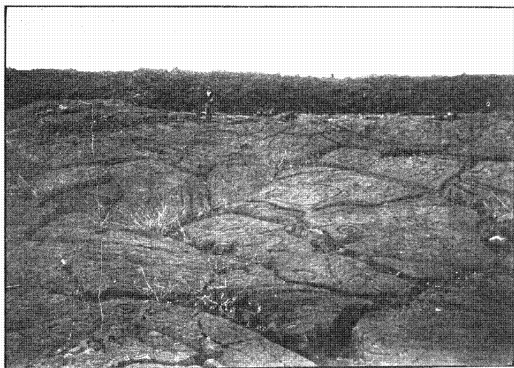


FIG. 35.

PETROGLYPHS AT PUANAHULU.

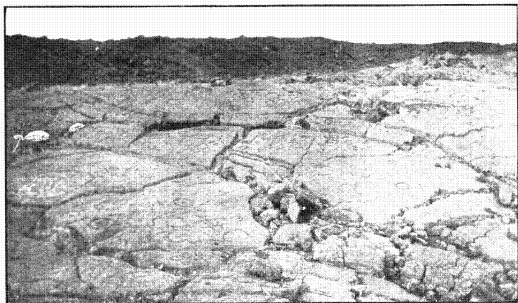


FIG. 36.

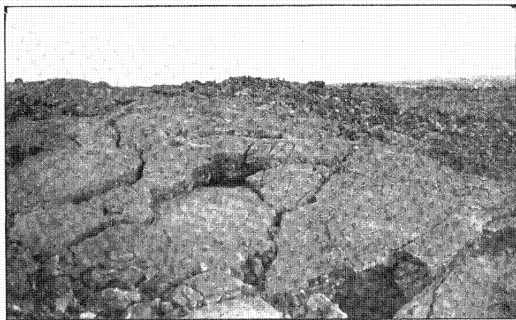


FIG. 37.

PETROGLYPHS AT PUANAHULU.



FIG. 38.

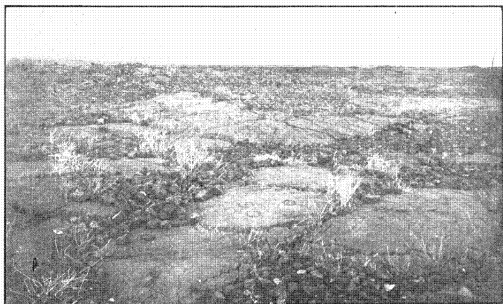


FIG. 39.

PETROGLYPHS AT PUANAHULE.

With the careful study of the illustrations, many new forms may be seen. One striking peculiarity was the use of irregularly circular lines for the inclusion or separation of groups of petroglyphs, perhaps for the purpose of limiting or defining a particular record. There were forms innumerable, forms not suggestive of the human or animal, which from this grouping could leave but little doubt that they told a connected story. They left a strong impression that the Hawaiians had made a decided advance towards a written language. Ellis' concentric rings were here aplenty, and cup-marks, isolated and grouped. Mostly on the outskirts of this interesting area were many names of Hawaiians, sometimes dated, and more initials. It seemed to have been a time-honored place for recording events. The place had been isolated by the flow of lava in 1859 and is not easy of approach. It is doubtful if Ellis visited this spot, though he landed at "Wainanarii" (now unknown) two hours canoe journey from Kiholo. If we call this distance nine miles, it would mean that he landed within a mile of the petroglyphs. Ellis rested at "Wainanarii" a few hours, and merely mentioned that as it was Saturday he found the natives spending their time preparing for the Sabbath. It is most regrettable that Ellis did not continue his journey a little inland, as had that careful and accurate observer seen the petroglyphs at Puuanahulu, Hawaiian ethnology would probably be richer today by the explanations and views of the natives of his time.

Molokai.—Molokai was visited in the middle of 1909. At Puu Hakina, towards the south-west corner of the island, and about two miles north-west of Hale o Lono is a low, rocky hillock. On the top of the rise were three stones standing in line, each marked with shallow cut figures on the vertical side facing the south (Fig. 40). The figures were not marked before photographing. The index finger of the man holding the tape is one foot from the lower part of the wire. The most striking form in this series is that of a male on the middle stone; in addition to a wide, tapering trunk and twisted limbs, it has an oval loop reaching from the neck high above the head. Below these stones and about fifteen feet to the south is a terrace artificially walled up. Fig. 41 shows the wall faintly, and three men sitting on the graved stones. Mr.

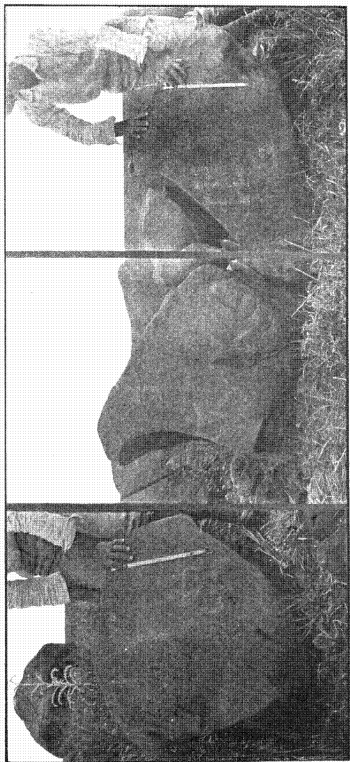


FIG. 45. PETROGLYPHS AT PUC HAINA.

John Burrows, keeper of the lighthouse on the south-west cape, first noticed these figures in 1891, and said that they looked as distinct then as when he showed them to the writer.

Kalaina wawae (Figs. 42-45) were seen on an ancient highway along the north side of the island. The spot is one and one-half miles west of the Momomi huts and one-half mile from the sea. Here on a slope of air-formed sandstone were numerous oblong depressions, said to represent human footprints. The legend

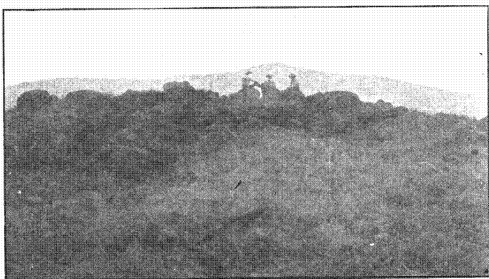


FIG. 41.

extant concerning the cause and origin of these marks, was to the effect that Kalaina, a prophetess (or as the narrator quaintly expressed it, a crazy woman) lived at Momomi nearby. One day she went to the trail and made two box-like hollows in its surface. The next day she called the people to the place and showed them her work. "See what I have done! Bye and bye people will come from the sea with feet like these." It is said that this announcement was a prophecy of the arrival of the boot-wearing Caucasian. On this account the place has since been known as *Kalaina wawae*—Kalaina's feet. Following this event, visitors from other parts of Molokai and the other islands of the group have been accustomed to leave their marks in similar form when traveling along the road. This account was received from one man. Another said that he had heard of the footprints being

made by visitors to Momomi from the rest of Molokai and the other islands.

If credence is to be given to these accounts, and there is no reason why it should not be, then a definite minimum limit of age can be placed on the origin of the custom.

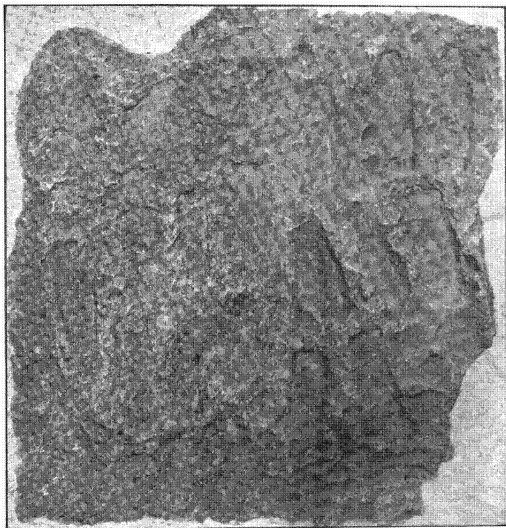


FIG. 12. SLAB OF SANDSTONE SHOWING "FOOTPRINTS."

An estimate of the number made, taken from the worn down and almost obliterated traces, would be above five hundred. Very frequently they were in pairs. The majority were just about 12 inches long, and none were found appreciably longer. There were quite a few 9 inches long, and one pair 4 inches long; in depth they varied from .5 inch to 2 inches. Toed "foot-prints"

were only found in four instances, and one pair had deeper depressions at one end which might have represented heels of boots. In all but two instances noticed, the marks are hollows of such a shape and size as a native might make by outlining his or her bare foot (or sometimes sandal) on the sandstone and wearing down the enclosed area by hammering the surface with a hard substance. As one possible bit of evidence that the abrasion was done in the manner described it might be mentioned that a flat oblong piece



FIG. 43. OUTLINED "FOOTPRINTS."

of hard basalt (Fig. 46) was found on the trail among the "footprints." It was 5 inches long, 3 inches wide and 1.5 inches thick, with the ends worn and rounded as might well have been done by repeated blows on the sandstone. It weighed 25 ounces and rested comfortably in the hand as a striking implement. The sandstone, while soft enough six inches below the surface to be crumbled between the fingers, was yet too firm to be rubbed away by the hand where exposed to the weather. The surface was broken very readily, however, when pounded with a stone.

The two exceptions noted above are feet merely outlined (Fig. 43) and not intended to be hollowed. The complete outline in the illustration is 12 inches long.

During the past forty or fifty years the ancient road has been mainly used by cattle traveling to and from the uplands on the west, and the animals' hoofs wearing down the sandstone have almost obliterated the majority of the carvings. Fortunately a little to the south side of the trail, several blocks of the footprints were found in comparatively good condition, and through the kindness and assistance of Mr. Geo. P. Cooke, the manager of the

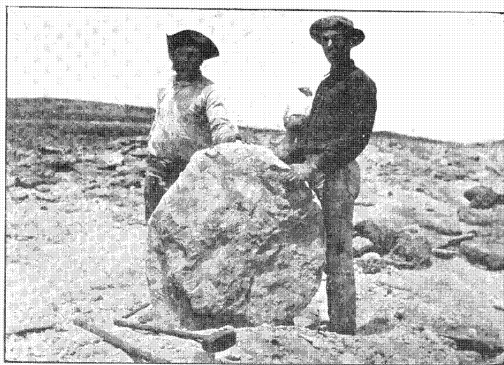


FIG. 44.

Molokai Ranch on whose property the trail lies, three slabs (Figs. 42-44) were cut out and sent to the Bishop Museum. A fourth (Fig. 45) was left, walled in, as it was considered impracticable to remove it with advantage on account of its size and the crumbly condition of the stone.

Judd refers to these footprints, and also faint remains of petroglyphs representing the human form. Trace of only one was seen by the writer, but a visit at a different time of day with a slanting light would probably give more. It was somewhat pleasing to note an absence of names and initials.

About the middle of the north side of Molokai is a hill called variously Kaulana-hoa by Fornander, Puu Nanahoa by Brigham

and Judd, Puu Lua by the Government Survey. A number of boulders cover the top, and on them are many faint petroglyphs. Fornander¹⁶ saw in two of them the double trident of Siwa, and on this account associated the gravings with phallic worship. I cannot say that Fornander's surmise is not correct, but the figures I saw looked more like the representation of a male with raised arms. Krämer and Judd describe and illustrate a number of the petroglyphs, adding to the forms already noted herein, figures with six limbs.

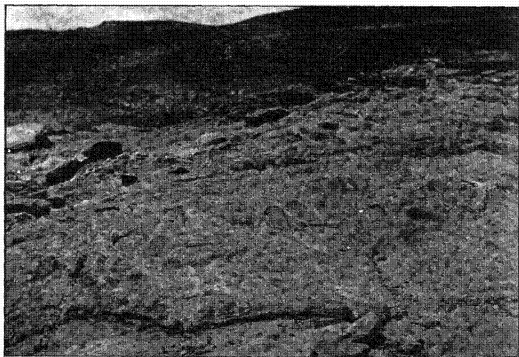


FIG. 45.

Oahu.—Thrum and Judd¹⁷ describe petroglyphs on the ceiling and floor of a sea-worn cave (Fig. 47) in the tufaceous side of Koko crater, at the east end of the island. Since then one of the figures has been cut out and removed. There is a smaller cave in the same hill, one-quarter of a mile to the south, and on the ceiling of this is part of one of the common form of carvings.

At Helemanu, in Waialua, Mathison saw a stone covered with petroglyphs, of which he gives an illustration of a draw-

¹⁶ Polynesian Race, vol. i, p. 50.

¹⁷ Hawaiian Annual, 1900, p. 126; 1904, p. 179.

ing taken on the spot. A copy may be seen in the Hawaiian Annuals for 1898, page 122, and 1904, page 180. While some of the pictures may pass for Hawaiian work, others do not resemble anything yet noticed in this group, nor in Mallery's splendid record of pictographic writing. A cannibalistic foreigner is reputed to have used this stone as a platter, and Dr. Alexander, a noted authority on Hawaiian history, expressed the opinion to the writer that the man was a Marquesan. Petroglyphs found in those islands may throw some light on the subject. The stone is believed to have been demolished in 1895.

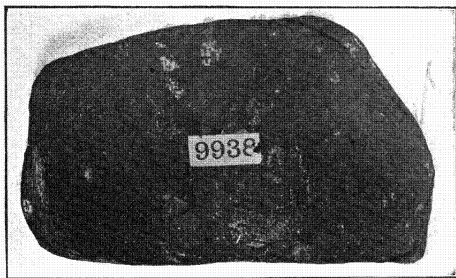


FIG. 46. STONE FOR MAKING "FOOTPRINTS."

Kauai.—From this island come interesting accounts by Farley and Judd of petroglyphs on the beach at Keonelo, near Koloa. Farley counted seventy-six figures measuring from 1 to 6.5 feet, and Judd later observed others which brought the maximum measurement up to 7 feet. These do not by any means constitute the entire number at that place, as it is reported that there are still large tracts of petroglyphs covered by the beach sand. Those examined had been laid bare by the waves during a storm. Farley also gives an account, by an old Hawaiian woman, of these having been seen by her in 1847 when accompanied by her school teacher, her fellow pupils and two Roman Catholic priests, and of the existence of figures of birds and fish, and an un-Hawaiian vessel with

strange animals in it. The investigations carried on at that time, according to the old woman, resulted in the information being gathered that, while the Hawaiians of the day had seen the pictures, they neither knew who made them, nor why they were done.

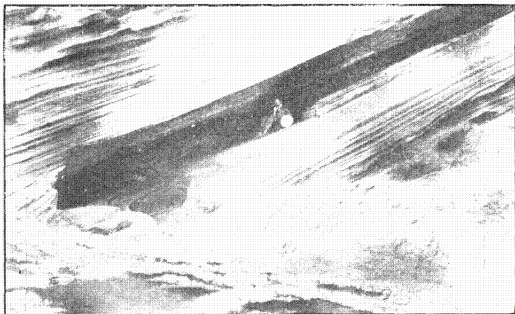


FIG. 47. SEA-WORN CAVE ON EAST SIDE OF KOKO CRATER.

Through the kindness of Mr. Judd, rubbings of five figures on the rocks at Papalinahoa, Nawiliwili Bay, made by his brother Charles in 1906, have been given to the Museum, and are illus-

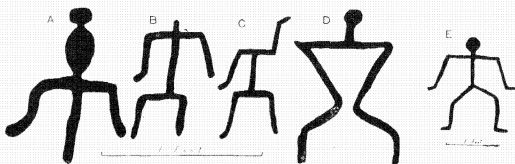


FIG. 48. PETROGLYPHS FROM NAWILIWILI BAY.

trated herewith (Fig. 48). Two of these five are particularly striking, viz., "D" armless, and with the outlines of the triangular body not joining at the hips, but continued into the legs; and Fig. "A" with the bulbous solid trunk also armless. The latter may represent a male, or an idol carried on a pole.

I am indebted to Dr. E. S. Goodhue of Hawaii, formerly of Kauai, for the information that there is a sculptured rock on the southern side of Kauai, inland. For those who may be interested and live near the spot, his directions are repeated. The stone is large and conspicuous, about one hundred and fifty feet *makai* of

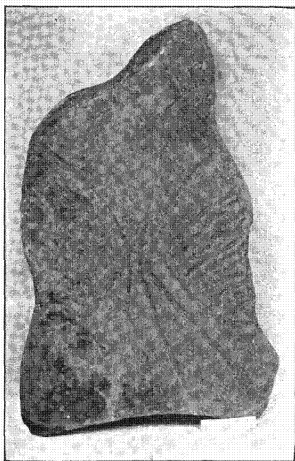


FIG. 49. PETROGLYPHS FROM TUBUAI, AUSTRAL IDS.

the road from Koloa to Eleele, on the Koloa side of the road and on the top of the hill going down into Lawai gulch. It is about opposite the juncture of the Lihue and Koloa roads.

Niihau.—Judd mentions petroglyphs at a place called Kii.

From the Polynesians, excepting the New Zealanders, Easter Islanders and Hawaiians, the writer has information of but two specimens of rock-carvings. Fig. 49 will show a slab of compact basalt, twenty-five inches long and four thick, from Tubuai.

Austral Islands, collected for the Museum by Mr. Seale in 1902. The channels are .1 inch deep and .6 inch wide, and had been slightly scratched by a pointed tool (as may be seen in the illustration) before the specimen reached the Museum. It was broken from the smallest of a circle of upright stones, all similarly graved. The surface of the stone has been bleached to a depth

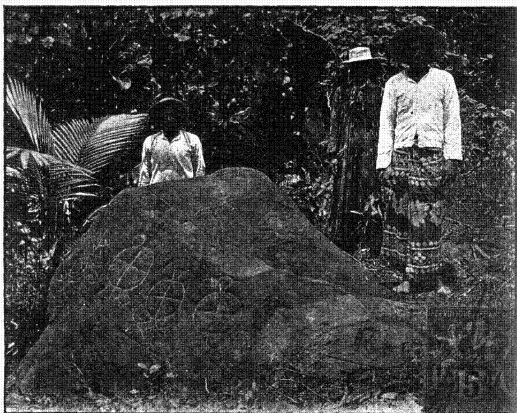


FIG. 50. PETROGLYPHS FROM BORABORA, SOCIETY IS.

varying from .1 to .3 inch by weathering and makes a strong contrast with the almost black stone showing at the broken edge. The bleached part is naturally softer than the interior, and if this skin had been penetrated by the graving in order to bring out the contrast of the dark and the light, the weather has since made the whole surface uniform.

The other instance is of several petroglyphs on a large stone in Borabora, Society Islands. A postal card illustrating these was given to the writer, in answer to enquiries for rock-carvings in the South Pacific, by an officer of the French cruiser "Protet," and I

much regret that his name has slipped my memory. These petroglyphs (Fig. 50) show a workmanship which seems to far surpass that of the Hawaiians, and it is hoped that some investigation may soon be carried on in this interesting field, if it has not been done already. All the literature relating to the southern islands, which has so far been delved into, is silent on the subject.

At the present stage of investigation of Hawaiian petroglyphs and with meagre information concerning them gleaned from native sources, it seems premature to attempt an explanation of the objects or uses to which these primitive or literary efforts may have been applied.

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New Hawaiian Plants.—II.

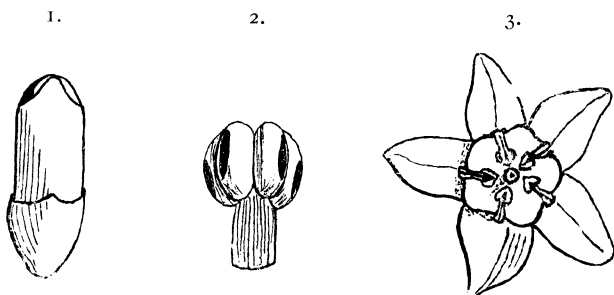
CHARLES N. FORBES.

APRIL, 1910.

***Exocarpus luteolus*, sp. nov.**

Frutex 2-18 cm. altus; foliis cuneatis, coriaceis, subsessilibus, 2.5-5.5 cm. longa, 1.5-2 cm. lata; spicis 3.8 cm. longis. Perianthium viride, lobis acutis. Capsula cylindricalis, 1 cm. longa, apice acuto.

Type locality, wet places in and bordering the Wahiawa swamp, Kauai. Elevation, 2000 feet. Specimens were first sent by Mr. J. M. Lydgate in May, 1908. The type is No. 260. Forbes & Lydgate, August, 1909.



DIAGRAMS OF EXOCARPUS LUTEOLUS FORBES.

1. Fruit. 2. Stamen. 3. Flower. All variously enlarged.

A shrub two to six feet high. Leaves cuneate to oblong-lanceolate, inclined to be concave, thick coriaceous, subsessile, yellowish-green, veins rather indistinct, 12-24 \times 7-9 lines. Spikes 1.5 inches long, four- to nine-flowered with many empty bracts below. Perianth very small, greenish, five- to six-parted; its lobes acute, one-half of a line long. Nut cylindrical, nearly five lines long, pointed at the apex with four indentations.

In many respects this species seems to be intermediate between *E. Gaudichaudii*, A. DC., and *E. brachystachys*, Hillebr. It differs in its much longer spikes, and in having only expanded leaves, these being stiffer, of a more yellowish green, usually smaller and of a different shape than those of *E. brachystachys*



EXOCARPUS LUTEOLUS FORBES.

Summary of the Collection of Insects in the Museum.

BY OTTO H. SWEZEY, M.S.

THE Bishop Muséum portion of the insects collected by Dr. R. C. L. Perkins has hitherto been stored in the original boxes in which they were returned from England, after having been worked up, but during the years 1908 and 1909 they have mostly been transferred to exhibition drawers of the Museum cases at the north end of the first gallery of Hawaiian Hall, where they are convenient of access to those wishing to see or study them. Additional instalments were received during 1909, and these are as yet retained in store boxes. The *Hemiptera* have not yet been received, and there are possibly a few yet to come of some of the other orders. Those on hand at present are summarized on the following page.

A small exhibit of unnamed Japanese insects given by Mr. G. P. Wilder comprises the following: *Hymenoptera*, 34 specimens; *Lepidoptera*, 259 specimens; *Coleoptera*, 158 specimens; *Hemiptera*, 15 specimens. Total, 466 specimens.

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SUMMARY OF THE COLLECTION OF INSECTS IN THE MUSEUM.

Summary by Families.	Number of Specimens.			Number of Species.	
	In Collection	On Exhibition	In Storage	In Collection	In F. Hawaiianensis
HYMENOPTERA—					
Formicidae	173	107	66	16	20
Apidae	33	12	21	5	4
Prosopeidae	475	392	83	41	52
Eumenidae	774	503	271	71	86
Vespidæ	16	6	10	3	3
Crabronidae	318	271	47	17	21
Trypoxylonidae	31	11	20	3	2
Mimesidae	59	48	11	8	10
Sphegidae	3	3		1	1
Bethylidae	157	157		8	18
Proctotrypoidea	4	4		1	8
Cynipoidea					9
Chalcidoidea	92	92		18	44
Ichneumonidea	113	101	12	26	49
LEPIDOPTERA—					
Caradrinidae	104	104		25	39
Plutidae	116	116		11	15
Hydromenidae	62	62		7	17
Selidosemidae	290	290		24	37
Sphingidae	11	11		3	7
Nymphalidae	41	41		5	5
Lycanidae	19	19		2	2
Phycitidae	27	27		4	7
Galleriidae					1
Crambidae	5	5		3	8
Pyraustidae	587	587		115	169
Pyralidae	2	2		1	2
Pterophoridae	21	21		6	6
Ornithodidae					2
Gelechiidae	65		65	18	45
Oecophoridae	6		6	1	1
Hypomomeutidae	571		571	160	276
Carpocossidae	95		95	23	33
Tortricidae	96		96	22	49
Tineidae	47		47	11	27
DIPTERA—	141	141		62	180
NEUROPTERA—					
Odonata	223		223	25	29
Hemeroptidae	197		197	32	54
Psocidae	85		85	19	25
Termitidae					2
Embiidae					1
COLEOPTERA—					
Carabidae	1859	1859		143	210
Cerambycidae	504	504		40	54
Curculionidae	701	565	136	84	137
Scolytidae	15	15		11	26
Proterhinidae	1603	1037	566	108	122
Anobiidae	1636		1636	67	*
Elaterridae	234		234	40	81
Dermestidae	49		49	16	26
Nitidulidae	891		891	94	143
Histeridae	69		69	28	38
Staphylinidae	260		260	44	119
Cloidae	296	296		31	42
Miscellaneous Families	321	127	194	72	108
ORTHOPTERA—					
Dermaptera	89	89		6	7
Blattodea	36	36		10	15
Acridoidea	4	4		1	1
Locustodea	30	30		10	13
Gryllodea	127	127		24	36
Totals	13,783	7,822	5,961	1,626	2,544
Summary by Orders.					
Hymenoptera	2248	1707	541	218	327
Lepidoptera	2165	1285	880	441	748
Diptera	141	141		62	180
Neuroptera	505		505	76	111
Coleoptera	8438	4403	4035	778	1106
Orthoptera	286	286		51	72
Totals	13,783	7,822	5,961	1,626	2,544

* Not yet published.

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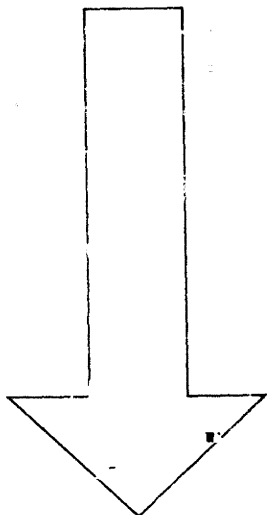


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